

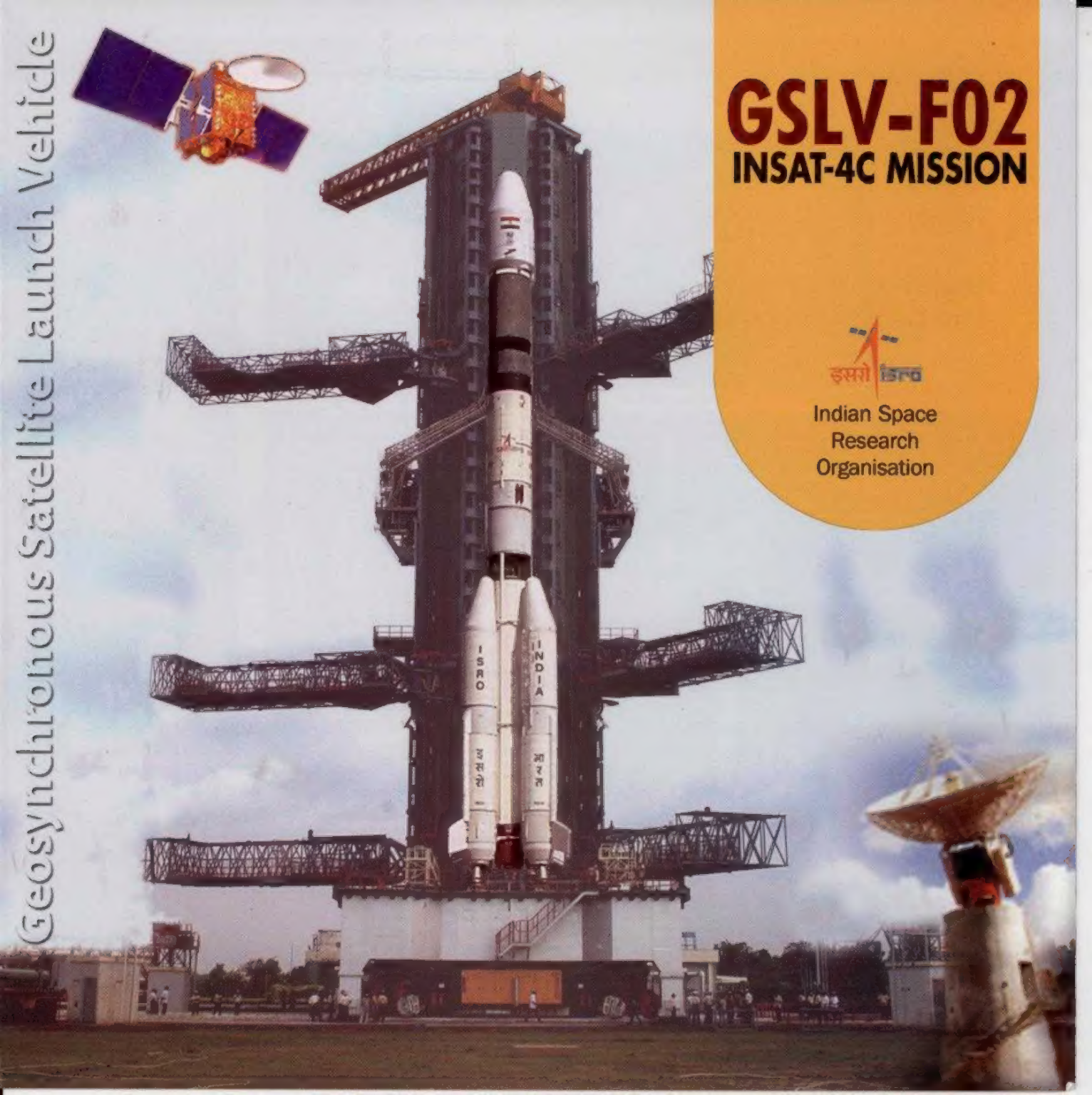
Geosynchronous Satellite Launch Vehicle

GSLV-F02

INSAT-4C MISSION



Indian Space
Research
Organisation



Mission Objective

Launch of INSAT-4C
into Geosynchronous Transfer Orbit



Mission Specifications

Orbit	: GTO
Perigee	: $170 \pm 5\text{km}$
Apogee	: $35975 \pm 675\text{km}$
Inclination	: $20.71 \pm 0.1 \text{ deg.}$
Argument of perigee	: $178 \pm 0.2 \text{ deg.}$
Launch Azimuth	: 106 deg

Vehicle Configuration

(4L40H + S139) + L37.5H + C12

Vehicle height	: 49.128m
Lift off mass	: 414.75t
Stages	: 3
First stage (GS1)	: S139 + 4L40H
Second stage (GS2)	: L37.5H
Third stage (GS3)	: C12

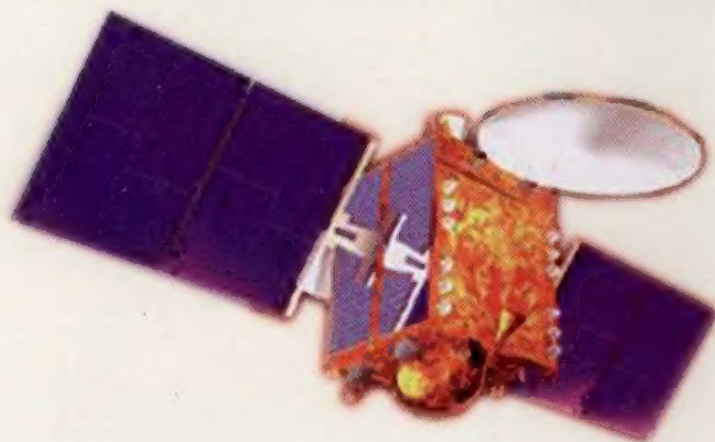


Major changes from GSLV-F01

- Launch from Second Launch Pad ■ Remote Fill and Drain System (RFDS) in GS2
- Remote Mounting Safe Arm (RMSA) for retro rocket ignition
- Telemetry changed to 2 chains from 4 ■ Re-engagable LHRS
- S139 Nozzle without SITVC Ports.

INSAT-4C salient features

INSAT-4C



Satellite under preparation

		Payload	: 10/12 Channel High Power Ku-Band Transponders Ku-Band Beacon Transmitter 2.2mx2m Offset Shaped Reflector Antenna (Tx) East side 1.4m Offset Shaped Reflector Antenna (Rx) West side
		Onboard Power Generation	: 2867 W (2 wing solar array with 2 panels per wing)
		Battery	: 2 x 70 Ah nickel hydrogen
Size	: 1.65X1.53X2.4m cuboid (Launch Configuration)	Deployed Configuration size	: North-South 9450 mm East-West 5950 mm
Lift off Mass	: 2180 kg	On-orbit Attitude Control	: Momentum biased 3-axis stabilized mode Bipropellant – MMH, MON-3
Bus Configuration	: Standard I2K with stretched propellant tanks		
Location in orbit	: 74 ° East		
Mission life	: 10 years		

Additional Qualification Tests for SLP Launch

GSLV-F02
INSAT-4C MISSION



CSFM Test



L 40 mockup test



Wind tunnel test



CBS structural test

Flight Sequence

The overall flight sequence is given highlighting the nominal time, altitude and inertial velocity at critical flight events. Actual time of occurrence can vary since they are decided onboard.

GSLV F02 Flight Profile



Event	Time(s)	Altitude(km)	Velocity(km/s)
L40H Ignition	-4.8	0.0	0.45
Lift-off (S139 Ignition)	0.0	0.0	0.45
GS1 shut-off	147.5	68.8	2.82
GS2 Ignition	148.1	69.1	2.82
GS1 separation	149.7	70.4	2.82
IS 1/2 M separation	155.5	74.7	2.88
Payload fairing separation	228.9	115.0	3.91
GS2 separation	290.6	131.9	5.38
GS3 Shut-off	1000.5	218.5	10.22
Satellite separation	1015.5	231.9	10.22

Earlier Flights



GSLV D1/G-Sat 1 Mission
Spacecraft mass: 1540 kg
April 18, 2001



GSLV D2/G-Sat 2 Mission
Spacecraft mass: 1823 kg
May 8, 2003



GSLV F01
Edusat Mission
Spacecraft mass: 1950 kg
September 20, 2004



GS1 Segment assembly



L 40H assembly



L 40H & S139 assembled



GS2 assembly



Cryo stage assembly



Vehicle mockup movement to UT



Equipment bay assembled to vehicle



Encapsulated assembly

GSLV-F02
INSAT-4C MISSION

GSLV F02
Vehicle Stacking
at
VAB-SLP



Maiden GSLV Launch from Second Launch Pad

SLP

Published by V S Geetha Rani for Documentation Cell, GSLV Project, VSBC, Thiruvananthapuram
Printed at St. Joseph's Press, Thiruvananthapuram-14